Application No. 09/310,024
Reply to Office Action of June 16, 2004

REMARKS

After the foregoing Amendment, claims 9, 11-15 and 17-21, as amended, are pending in this application. Claims 15-21 have been allowed by the Examiner. Claims 9, 11, 12, 15, 17 and 18 have been amended to more particularly point out and distinctly claim the subject matter which Applicant regards as the invention. Claims 1-8, 10 and 16 stand canceled.

Applicant respectfully requests that the Amendment After Final be entered in accordance with 37 CFR §116 and MPEP 714.13 since: (1) no new matter has been added to the application by the Amendment; (2) the Amendment resolves all issues raised by the Examiner in the Final Office Action; (3) the subject matter of the Amendment already has been included in the Examiner's search and therefore does not require the Examiner to perform further searching; (4) the Amendment places the application in condition for allowance or in better form for appeal and (5) the Amendment does not result in a net addition of claims to the application. Applicant submits that no new matter has been added to the application by the Amendment.

The Present Invention

When applying the method of Barnsley et al. to image magnification, discontinuities arise between the boundaries of the range blocks, presenting a problem of image quality. The present invention is an improved method and device for transforming an image into a magnified image based on the method of Barnsley et al. in which corrections are applied to the image to reduce discontinuities at the boundaries in the magnified image to thereby increase the quality of the magnified image.

The claimed method of the present invention comprises: (1) performing interpolation processing of each picture element of the original image to form an image having a predetermined magnification (2) performing fractal processing of the original image and transforming it to a fractal transformed image magnified up to the predetermined magnification and (3) creating a magnified image by: (a) comparing the interpolation transformed image and the fractal transformed image, (b) selecting one or the other of the images for output based on the comparison, and (c) applying corrections to the element values of the selected image prior to outputting the image.

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Rejection - 35 U.S.C. § 112

The Examiner rejected claims 9-14 under 35 U.S.C. § 112, second paragraph as

being indefinite for failing to particularly point out and distinctly claim the subject matter which

Applicant regards as the invention. Applicant respectfully traverses the rejection.

Amended claim 9 recites, *inter alia,*

> *A method of image transforming, comprising the steps of:*
> > *generating from an original image having a plurality of original*
> > *picture elements a plurality of new picture elements, each*
> > *of which being formed from neighboring picture elements*
> > *selected from the plurality of original picture elements, and*
> > *forming a first transformation image by arranging the new*
> > *picture elements among the plurality of original picture*
> > *elements;*
> > *dividing the original image into a plurality of first regions each*
> > *having picture elements, <u>scanning</u> respective second*
> > *regions each having picture elements <u>similar</u> to the picture*
> > *elements in the first region, and forming a second*
> > *transformation image by <u>replacing</u> the picture elements in*
> > *the first region <u>with</u> the picture elements in the second*
> > *region;*
> > *comparing values of respective picture elements in respective*
> > *corresponding regions of the first transformation image*
> > *and the second transformation image <u>to obtain a difference</u>*
> > *<u>of the values;</u> and*
> > *on the basis of the <u>difference, outputting one or the other of the</u>*
> > *<u>respective corresponding regions.</u>*

Claim 9 has been amended to make clear: (1) that the comparison of the images is

based on the difference of the element values of the images and (2) that the first and second

transformations are different because the first transformation is formed by <u>arranging the new</u>

<u>picture elements</u> among the plurality of original picture elements, and the second transformation

is formed by <u>replacing</u> the picture elements in the first region with the picture elements in the

second region. Accordingly, Applicant respectfully requests reconsideration and withdrawal of

the § 112 rejection of claim 9.

Further, it is respectfully submitted that since claim 9 has been shown to be

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allowable, claims 11-14 dependent on claim 9 are allowable, at least by their dependency. Accordingly, for all the above reasons, Applicant respectfully requests reconsideration and withdrawal of the § 112 rejection of claims 11-14.

Rejection - 35 U.S.C. § 103

The Examiner rejected claims 9-14 under 35 U.S.C. § 103 as being unpatentable over U.S. Patent No. 5,065,447 (Barnsley et al.) or U.S. Patent No. 5,148,497 (Pentland et al.) in view of Official Notice. Applicant respectfully traverses the rejection.

The Examiner states that Barnsley et al. discloses a method of fractal processing and Pentland et al. discloses an image interpolator. The Examiner also states that the cited art does not disclose deciding which image to output after the processing but states that the claims recite an intended use and do not recite a structural difference from the cited art. The Examiner states that if the structure of the cited art is capable of performing the intended use, it meets the claim.

Applicant has amended claim 9 by replacing the phrase "deciding to output" with the phrase "outputting one or the other of the respective corresponding regions" in order to eliminate any interpretation of the claim that could be construed as "intended use". Neither Barnsley et al. nor Pentland et al. teach or suggest a fractal filter that outputs one or the other of a fractal transformed image or an interpolated image based upon the difference of element values in the images.

Applicant further submits that Barnsley et al. and Pentland et al. are not properly combinable under 35 U.S.C. § 103. Barnsley et al. teaches creating an image comprising a set of identifiers of selected mapped range blocks and does not teach or suggest creating an <u>additional</u> image from an interpolator as taught by Pentland et al. Neither is there a teaching nor a suggestion in Pentland et al. of providing an interpolated image as an additional image to a fractal transformed image as taught by Barnsley et al.

Also, Applicant submits that amended claim 9 recites a structural difference from the prior art and does not recite an intended use. Consequently, Applicant submits that the combination of Barnsley et al. and Pentland et al. in combination with Official Notice does not

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make claim 9 obvious. Accordingly, for all the above reasons, Applicant respectfully requests reconsideration and withdrawal of the §103 rejection of claim 9.

Further, it is respectfully submitted that since claim 9 has been shown to be allowable, claims 11-14 dependent on claim 9 are allowable, at least by their dependency. Accordingly, for all the above reasons, Applicant respectfully requests reconsideration and withdrawal of the § 103 rejection of claims 11-14.

Claims 15 and 17-21

Although previously allowed, Applicant has amended claims 15 and 17-21 to make the functional description in each of claims 15 and 17-21 consistent with claims 9 and 11-14. Accordingly, Applicant respectfully requests continued allowance of claims 9 and 11-14.

CONCLUSION

Insofar as the Examiner's rejections have been addressed, the application is in condition for allowance and Notice of Allowability of claims 9, 11-15 and 17-21 is therefore earnestly solicited. Should the Examiner choose to issue an advisory action, Applicant respectfully requests that prior thereto, the Examiner telephone the undersigned at the telephone number indicated to discuss the application.

Respectfully submitted,

NOBUHITO MATSUSHIRO

September 9, 2004
(Date)

By: _____

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